Water Resources Management and Technology
South Africa

Johan van Rensburg
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Summary

In semi-arid South Africa water is extremely scarce and most rural and suburban communities do not have access to residential waterborne sanitation systems. Furthermore, the declining state of municipal wastewater treatment plants has led to numerous problems in terms of drinking water contamination by wastewater, and this continues to result in regular outbreaks of waterborne diseases such as cholera and typhoid fever. South Africa is in urgent need of new wastewater plants, upgrades of existing installations and proper training of municipal technical resources staffing these wastewater treatment plants.

The water industry in South Africa, analogous to government, incorporates a three-tiered structure comprising Central Government (the Department of Water Affairs and Forestry - DWAF), Water Boards or Utilities and Local Authorities or Local Committees (also known as Regional Service Councils, Municipalities or Community Councils).

The DWAF acts as the central controlling body, monitoring the use of South Africa's water resources and acting in co-operation with the various Water Boards who develop regional water supply and sanitation services. The emphasis is on empowerment of the communities themselves, and their participation in the supply of water and services through various community structures.

With 28 percent (or 12.8 million) of the overall population of 44 million currently without access to piped water, the DWAF has set as its objective the provision of adequate water supply i.e. potable water supply of 25 litres per person per day, within 200 m cartage distance. Included in the provision of adequate services, is the provision of sanitation for the approximately 16 million people who do not have access to adequate sewerage or sanitation.

The total annual consumption of water in South Africa has been estimated to be in excess of 16 billion cubic metres, and the DWAF has predicted a growth of between four and six percent per annum over the next few years. At present water consumption may be broken down as follows: 52.4 percent for agricultural, 12 percent for domestic (municipal) use, 7.5 percent for industry, 2.7 percent by mining and 2.3 percent for power generation. It has been estimated that domestic use will increase from 12 percent to 19 percent by the year 2010.

Increased water consumption demand means an increase in pollution, and consequently a greater need for pollution control measures. Mining, inefficient farming methods and effluent spillage from rural communities have been identified as the main causes of pollution - especially of rivers. The South African Government has set guidelines and established criteria for all water users - mines, industry, agriculture and municipalities, to bring themselves into line in this regard.

All of South Africa's water is supplied by its rivers. These are fed by less than 470mm of rain per annum (compared with a world average of 857mm).

1. Market Overview

South Africa is set to spend R372 billion ($62 billion) between 2007 and 2010 to implement the Accelerated and Shared Growth Initiative of South Africa (ASGISA). The ASGISA investment will include the provision of roads and rail infrastructure, water (including sanitation and wastewater provision), energy distribution, housing, schools and clinics, sports facilities and various government service centers to improve municipal service delivery to all the citizens of South Africa.

Part of the planned budget will be spent on accelerated infrastructure investment and development in underdeveloped urban and rural areas through existing municipal initiatives, such as the Municipal Infrastructure Grant and the Expanded Public Works Program.

Purification, monitoring, filtering, pumping and reticulation management are expected to be the areas of focus. With many municipalities currently under pressure to upgrade old wastewater treatment plants not functioning on a compliance level to acceptable health standards and building new wastewater plants to cover increased capacity needs in their municipal districts, opportunities for U.S. equipment and service providers will abound.

At the 15th Stockholm Water Conference in August 2005, South Africa reaffirmed its commitment to developing an integrated water resource management plan. At the conference it was stressed that the African continent is in dire need of wastewater treatment and purification works, desalination works and wastewater treatment installations to try and manage the water shortage.

South African makes wide use of standard wastewater treatment procedures and infrastructure, including activated sludge systems, biological filter systems with or without incorporated pond systems and aerobic and anaerobic treatment options for household and industrial wastewater reticulation. Modern management-friendly packaged sewage systems are also now being developed and introduced, with one such example being the rotating biological contact plant (RBC) that works well in rural wastewater treatment applications, as it does not require user-operated chemical balancing and complicated maintenance procedures. This technology can therefore effectively contribute to alleviating skills shortage issues.

South African wastewater problems and issues are not only related to the physical capacity of existing wastewater treatment plants, but also to the management, maintenance and proper training of operators of waste treatment plants.

Major re-development of wastewater plants are being undertaken, an example being the City of Tshwane – Pretoria that is South Africa's capitol, where wastewater is discharged to ten wastewater treatment works via 290km of bulk outfall sewers. A number of areas within this wastewater system have reached maximum capacity and will require upgrading in the near future.

Major shortcomings have also recently been identified in wastewater treatment in other provinces including the Free State and Cape provinces, that suffer from operational inefficiencies, equipment shortcomings, lack of skills, inadequate monitoring equipment and lack of proper chemical dosing equipment.
In addition to these core issues, South Africa also lacks basic emergency infrastructure to deal with potable water – wastewater contamination issues. This problem includes a lack of early warning systems to indicate sewage leakages into drinking water or industrial contaminants being dumped into streams. Adequate spillage cleanup plans and early warning systems, as well as proper infrastructure to supply emergency clean water to rural communities, could save many lives.
The South African Government, while acknowledging the shortcomings of the current wastewater management by local municipalities, has devolved responsibility for managing these issues to regional utilities and local municipalities, giving them autonomous decision-making power to remedy these issues.

The larger production industries in South Africa that make use of water in their production processes have dedicated closed-loop wastewater reticulation plants to supply their cleaned wastewater. Other industries that would potentially need assistance to clean their wastewater effluent to acceptable levels before dumping include breweries, ethylene plants, agro-chemical and chemical installations.

2. Best Prospects

Best prospects for wastewater projects for the period after 2008 include the implementation of biological sewage treatment processes, the treatment and recovery of organics from agro-industrial processes, the treatment and recovery of inorganic particles in industrial and mining effluents, bio-technological co-treatment of industrial effluent with sewage waste, the upgrading of sewage reticulation plants, upgrading and expansion of existing storm water infrastructure and finally the investigation of energy from waste applications.

The supply of waterless or water efficient waste sanitation systems is another potential best prospect for U.S. suppliers, especially considering the fact that many of the informal and rural settlements in South Africa do not have access to running water sources or waterborne sanitation. New wastewater technology should preferably not only meet the needs of developed infrastructure plants, but also provide alternative implementation options for suburban, rural and arid regions.

The South African wastewater industry is in need of professional training on maintenance and management of wastewater plants, with major focus needed on rural settlements and suburban developed areas. Proper long-term sanitation site planning and hands-on involvement by international partners in building new sanitation and wastewater treatment plants is also an area of immediate need.

Existing wastewater plants have fallen into disrepair due to lack of maintenance, causing many wastewater plants to function at less than 30 percent capacity, even though these plants have physical capacity to cater to much larger communities than what they are currently servicing. Basic wastewater plant spare parts such as aerators, screening systems and modern pump technology would be needed to maintain, repair and overhaul these plants.

Tshwane – Pretoria Municipality has wastewater plants that are currently running in excess of original planned capacity. In the 2007-2008 financial year plans to build new wastewater treatment plants to serve the massive influx of population settling in suburban areas of their traditional municipal regions of responsibility are being implemented.

The Tshwane – Pretoria wastewater budget includes the following amounts for the period 2007-2008: R 3,000,000 ($500,000) for new sewer infrastructure, R 40,000,000 ($6,600,000) for additional sanitation infrastructure, and R 75,000,000 ($12,500,000) for the implementation and upgrade of new and existing wastewater treatment plants in and around Tshwane, with at least two other plants being short-listed for upgrade in 2008-2009.

In the Free State immediate opportunities exist for the supply of wastewater monitoring equipment, purification and filtration equipment as well as purification chemicals, in the refurbishment of existing municipal wastewater treatment plants.

The Emfuleni – Vanderbijlpark Municipality is also planning major upgrades of existing wastewater treatment plants including purchasing new wastewater pumps. Emfuleni Municipality is also in need of water monitoring equipment and early warning systems to highlight water contamination by wastewater.

Rehabilitation of industrial wastewater is also a potential best prospect industry, with increased government monitoring of wastewater effluents to curb environmental damage, many industries need to increase the quality of their effluent considerably before they will be allowed to dump their effluent in water catchment

areas. Opportunities exist for monitoring equipment, cleaning technologies and expertise to the industries with wastewater effluent outfalls.

Another area of interest for U.S. equipment suppliers is wastewater sludge and the production of resalable products such as fertilizers and compost from A-grade safe and stable wastewater sludge. A niche market has developed for the supply of equipment for the monitoring and regular testing of wastewater sludge to monitor heavy metal contents, microbiological content (faecal coliform count, viable helminth ova count) and pollutant contents (including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc).

Other prospects for foreign entrants are in the high-end of the market. There are prospects in the South African market for US suppliers of equipment and technologies in the fields of:
Narrow filtration, Reverse osmosis, and UV radiation. These technologies can find application in general services, but also in the mining sector - traditionally a major polluter – in recovering potable water and separating water borne minerals during the beneficiation process.

The market for service providers (incl. consultants) is competitive; smaller independent players are undercutting larger service providers. Equally, for new foreign project contractors the entry threshold is high.

3. Market Access

U.S. suppliers interested in exploring these municipal wastewater opportunities should identify potential wastewater partners in South Africa, who should preferably be well-known service providers to local municipalities.

U.S. firms entering this market must contend with a typically mature market with well-established, mainly European competition. A trade agreement with the European Union enables many European products to enter South Africa duty free and at lower rates than U.S. products. It is a competitive market.

Newly formed Broad-Based Black Economic Empowerment (BEE) policies on redressing economic imbalances amongst historically disadvantaged communities require consideration by all firms planning to do business with the South African government.

A pivotal consideration with the government and parastatal procurement process is that manufacturers or suppliers to government qualify as BEE (Black Economic Empowered) partners. These criteria aim to quantify the contribution by these partnerships to empower previously disadvantaged individuals (i.e., those whose racial/ethnic original is described by the South African terms “Black”, ”Coloured,” and “Indian”) according to a varying mix of the following parameters:

- Black Ownership
- Black Management
- Percentage of Black Skilled Personnel
- Procurement from Black/BEE suppliers
- Skills Development Initiatives
- Other BEE Initiatives (e.g., social responsibility)
- Enterprise Development initiatives for Black businesses

Note that in BEE legislation, the term “Black” is used generically to refer to South African citizens of the following racial/ethnic groups: Blacks (those whose ancestry is exclusively/almost exclusively African), “Coloureds” (those of mixed European/African or European/Asian origin), or Indians (those whose ancestry originates in the Indian sub-continent).

Some U.S. firms meet BEE responsibilities through partnerships with South African BEE qualified companies. BEE Codes of Good Practice and other pertinent legislation may be found on DTI's website: http://www.dti.gov.za/bee/codes2005.htm

Entering into the municipal service or product provision arena in South Africa requires a Black Economic Empowerment (BEE) compliant local representative partner or agent as municipal tendering procedures require companies to pre-register as municipal service providers. In order to register as a municipal service provider all companies need to submit South Africa revenue tax details and company registration documents to the municipal tendering offices for approval and registration.

For more information on how to identify a suitable South African business partner contact the U.S. Commercial Service South Africa.

4. The Competitive Situation

There are currently approximately a dozen large South African companies concerned with wastewater and wastewater purification processes. These companies include: Nalco-Chemserve (U.S./South African merger), Cemo-Pumps, IST Technik (Division of IST Holdings), Kemplant, Becon Watertech, Multotec Holdings (Pty) Ltd, Ninham Shand Consulting, Africon, Bigen Africa and Sud-Chemie Water & Process Technologies (Pty) Ltd. among others. These companies mainly provide chemicals, equipment, consulting services and building of infrastructure to local municipalities and third party wastewater service providers.

Other international water industry companies represented in the water and wastewater industry in South Africa include:

- Lyonais des Eaux – France
- General des Eaux - France
- Zenon - Canada
- Adel Wiggins Group - U.S.
- Harvard Corporation - U.S.
- Hach Corporation - U.S.
- Golder Associates – Canada.
- Varisco (Italy)
- Lister (Germany)
- Hatz (Germany)
- Gilks water turbines (UK)
- Kent instruments (UK)
- Worthington (UK)
- Gormann Rupp (Germany)

UK supplied pumps have been in use for many years - dating sometimes from pre-sanctions times - and UK supplied Viking Johnson couplings and Rotock actuators are also used. The Swedish supply submersible pumps and Degremont (Aquazur) have been mentioned as having been able to supply air flotation technology at a good price. Other suppliers include Treligaz and Azonia (ozone equipment), Bossoni ball valves (Italy), Emmeti brassware (Italy), high temperature metres (USA), and Meinecke water metres (Germany).

Biwater is currently manufacturing aerators locally and screens are being produced by SA Mechanical Erectors. A company by the name of Humbolt is investigating the possibility of producing centrifuges locally. Ainsworth (UK) and Vosa valves are being locally manufactured and assembled.

The French and British tend to dominate the water treatment sector, the French are reputed to be more aggressive with regard to market penetration activities. The observation has been made that overseas companies who are doing particularly well, such as Meinecke for example, remained in the country during sanctions, thus engendering end-user loyalty. This is an important aspect as a number of end-users have mentioned that one of the problems with overseas companies is in the past they have tended to sell their products and having done so, to leave the country and abandon the end-users with no spares or after sales service.

It is likely that international companies, in expectation of capital expenditure and demand for water, will all be looking at similar opportunities. German, British and French companies are showing interest in obtaining big shares in a limited market. The French are leaders in large-scale water treatment and engineering projects, and therefore the water transfer schemes in South Africa represent a big export market for them.

Aquazur's current market share is thought to be around 31 to 36 percent, making it the largest player in the market. It has sophisticated technology and expertise.

Prospective supplier companies may have to consider not only the supply of equipment, but putting together turnkey projects which include aspects such as the raising of funds to pay for the projects.

5. Important Stakeholders

Regional and local municipalities are the primary end-users of wastewater equipment in South Africa. These municipalities are quickly undergoing massive structural changes due to population growth and the addition of ever increasing responsibilities to their governing portfolios. This trend is creating mega-cities with municipalities that service entire regions. With suburban settlements increasing along the outskirts of the traditional municipal borders, the markets that need to be serviced by local municipalities are ever-increasing and diverse; simultaneously a growing need exists to provide not only environmentally sound but also culturally sensitive sanitation and wastewater solutions.

The prevailing trend is for district and local municipalities to have their own wastewater management divisions, such as the Pietermaritzburg Municipality (Kwazulu–Natal), Boksburg Municipality (Ekhuruleni Municipality), but if the local municipality is unable to provide wastewater services they could have their district municipality handle wastewater services on their behalf, for example Ekhuruleni Municipality would then manage wastewater on behalf of the Boksburg Municipality.

As mentioned earlier there are municipalities that have outsourced their wastewater and water utilities on a BMO (Build, Manage, Operate) level to third party service providers or Water Boards.

Umgeni Water is such a third-party water and wastewater utility, managing wastewater plants in Ixopo, Darvill, Albert Falls North and Howick in Kwazulu-Natal on behalf of local municipalities. Other third party water and wastewater service suppliers or Water Boards include: Amatola Water, Rand Water, Sedibeng Water, Erwat (Ekhuruleni Water), and Umgeni Water. These third party providers would then be end-users of wastewater technology and another potential market for U.S. suppliers.

This complicated regulatory structure and necessary insight into the management of South African wastewater facilities is another reason why having a local wastewater industry representative or partner already active and networked in South Africa is so important to U.S. suppliers entering into the South African wastewater market for the first time.

Department of Water Affairs and Forestry (DWAF)

Private Bag X313, Pretoria, 0001
Ms. Candice Williams (Assistant Directorate for Communications)
Tel: +27 (0)12 336 7455
Fax: +27 (0)12 324 6592
Website: http://www.dwaf.gov.za

C/O Frederika Street and 18th Avenue, Pretoria
Telephone: +27 12 330 0340
Fax: +27 12 331 2565
Email: info@wrc.org.za
Website: http://www.wrc.co.za

Water Institute of South Africa (WISA)

P O Box 6011, Halfway House, 1685
Telephone: +27 (0)11 805 3537
Fax: +27 (0)11 315 1258
Email: wisa@wisa.org.za
Website: http://www.wisa.org.za

6 Trade Events

Afriwater 2009 - International Water, Waste & Environmental Exhibition

Venue: Sandton Convention Center
Dates: 19 - 21 August 2009
Industry Sector: Water, Waste & Environmental Manager
Co-located with SUSTAIN
http://www.afriwater.co.za/

7 Import Market / Water Management Equipment

	2005	2006	2007 (est.)
Total Market Size	189	200	230
Total Local Production	29.7	33.9	34
Total Exports	10.9	11.99	13
Total Imports	159	165	176
Imports from the U.S.	29	32	45

Note:
All figures in $ millions. Above figures are unofficial estimates obtained from industry sources and exclude services. .
2005 Rand/Dollar exchange rate: $1 = R 6.37
2006 Rand/Dollar exchange rate: $1 = R 6.90
2007 Rand/Dollar exchange rate: $1 = R 7.00

For More Information

The U.S. Commercial Service in Johannesburg, South Africa, can be contacted via:
Mr. Johan van Rensburg, Commercial Specialist
E-mail: Johan.vanRensburg@mail.doc.gov
Phone: + 27 (0)11 778-4815
Fax: + 27 (0)11 268-6102
Visit our website: www.ussatrade.co.za

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